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DECEMBER 1962

# The 1962 FIRE SEASON in the PACIFIC NORTHWEST

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PACIFIC NORTHWEST  
FOREST AND RANGE EXPERIMENT STATION  
U.S. DEPT. OF AGRICULTURE • FOREST SERVICE



THE 1962 FIRE SEASON  
IN THE PACIFIC NORTHWEST

by

Owen P. Cramer

December 1962

PACIFIC NORTHWEST  
FOREST AND RANGE EXPERIMENT STATION  
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FOREST SERVICE

U.S. DEPARTMENT OF AGRICULTURE



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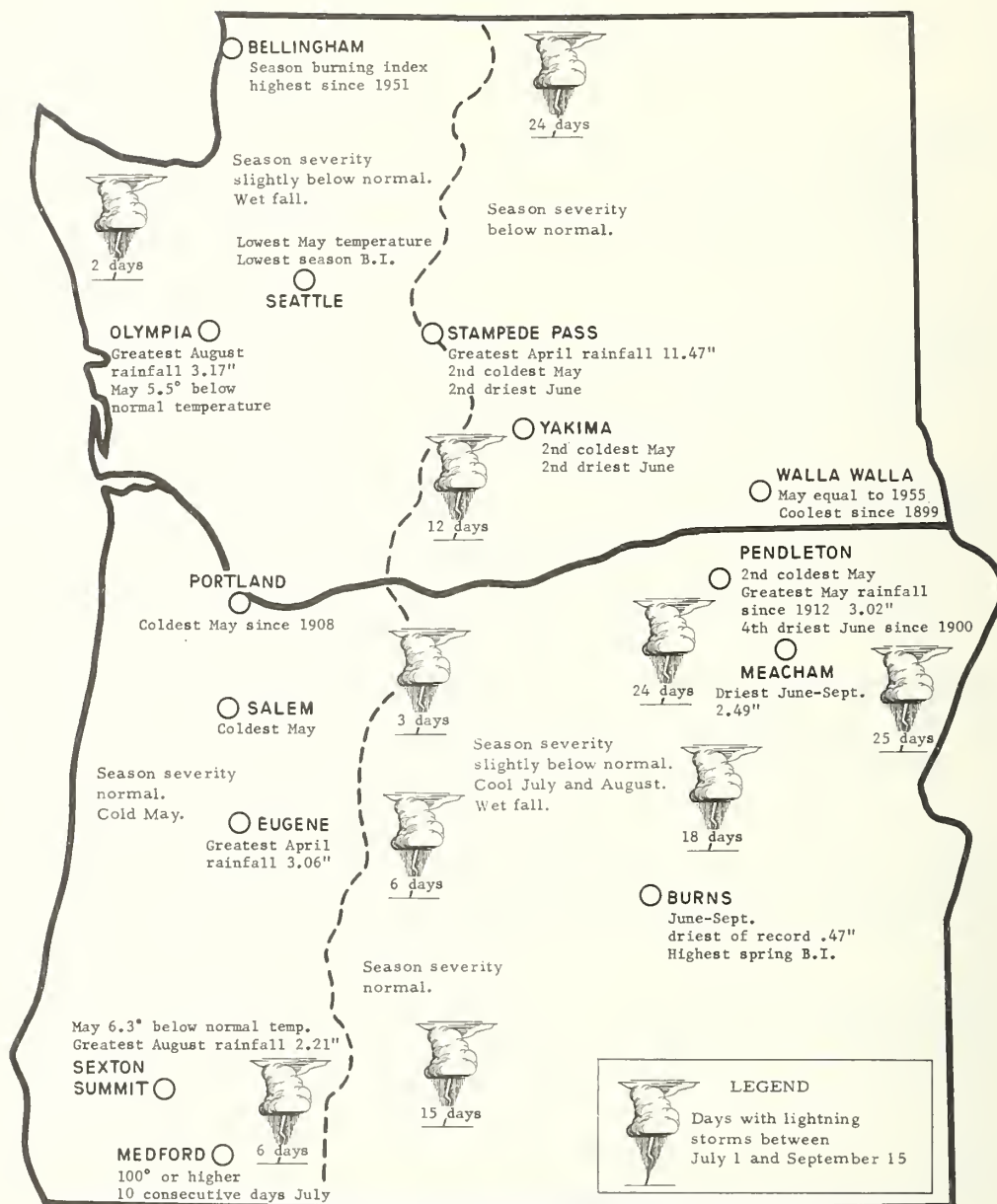


Figure 1. --1962 fire-weather highlights.



## SUMMARY

### Weather Conditions

The 1962 fire season was slightly less severe than normal in Washington and northeast Oregon and close to normal in western and south-central Oregon. In comparison with 1961, the season was less severe in Washington and northeast Oregon and about equal in western and south-central Oregon. During the heart of the season, temperatures averaged normal or below, and wetting rains in most areas broke up the normal summer droughts. Forests were generally damp as the deer season opened. There were the normal number of lightning storms in eastern Oregon and western Washington, more than normal in east-central Washington, and comparatively few over western Oregon and over the Deschutes National Forest (fig. 1).

Although April had normal rainfall, it was the only month of the fire season with distinctly above-normal temperature. May set many new records for cold temperatures, and rainfall was heavy. June and July were the driest months. In the first week of August, drenching rains soaked the west side, and light rains dampened the east side. July and August were 1° to 3° cooler than normal, while June and September averaged near normal but were cool the first half and warm the last half. West-side areas had wetting rains about September 10 and 28 with reasonably good slash-burning weather between. The rains that soaked all areas during the first half of October were heaviest in eastern Oregon. The last half of October was mostly dry, permitting some additional slash to be burned. Final gasp of the fire season came as an east wind November 1 and 2 gave west-side slash burners some trouble. The general season was closed by rains of November 4 and 9.

### Fire Occurrence

Protection agencies throughout the Region recorded fewer fires and less acreage burned than in 1961. The 1962 fire totals were also below 1960 figures, except for more lightning fires in eastern Washington and more man-caused fires on State and private lands in Oregon.

The totals tell most of the story. This past season 2,697 fires burned 13,528 acres, compared to 1961 when twice as many fires burned

nearly nine times as many acres. Lightning started 983 fires this year and 3,064 last year. Man-caused fires dropped from 2,587 in 1961 to 1,715 fires this year.

In the rangelands of southeastern Oregon, Bureau of Land Management crews fought 161 fires which burned 6,403 acres, compared to 290 fires and 150,000 acres in 1961.

### Computed Occurrence

On west-side National Forests of both States, number of man-caused fires greatly exceeded the number that would have been expected with similar fire weather during base periods ending with 1956. On State and private lands, only 66 percent of the expected number of man-caused fires occurred in western Washington and almost exactly the expected number in western Oregon. The percentage of fires holding at a quarter acre was as expected or slightly greater, except in western Washington National Forests where it was less. The percentage of fires becoming large was as expected or less in both half States.

## INTRODUCTION

### Fire-Weather Indexes

Severity of weather conditions during the 1962 forest fire season is compared with that in previous years by the use of three indexes of weather conditions that are closely related to the ease with which fires start, the speed with which they spread, and the depth to which they burn. These weather indexes are: (1) total number of days when no rain fell, (2) average number of days since a wetting rain of one-fourth inch or more, and (3) burning index, a rating of the combined effect of fuel moisture and windspeed on rate of fire spread. High burning index means high rate of spread. General severity of the season is judged by considering all three indexes.

Each index is an average of separate measurements from widely distributed Weather Bureau and Federal Aviation Agency stations and one

Air Force station.<sup>1/</sup> These valley and mountain stations have provided an unbroken record for the 7-month season both for the current year and many previous years, permitting valid comparisons of the present with the past.

### Computed 1962 Fire Occurrence

The principal reason for rating the severity of fire-season weather is to establish a basis for comparing fire occurrence between years. Foresters recognize that fewer fires will occur during a damp season and that their average size is likely to be smaller than during a dry and windy season. An intensive fire-prevention campaign may also result in fewer fires, and faster and stronger initial attack may result in smaller fires. The effect of prevention and suppression on fire occurrence cannot be evaluated, however, without knowing the effect of weather. In a separate study,<sup>2/</sup> high correlations were found between the season weather indexes and three measures of fire occurrence, permitting regression equations to be developed. These equations define the relations between fire occurrence and weather during 13- and 17-year base periods ending with 1956. The fire occurrence computed with these equations represents what would have been expected during the base period; differences between the computed and observed occurrence indicate changes in patterns of fire occurrence since the base period. The fire occurrence that would have been expected in western Oregon and western Washington under the 1962 weather conditions has been computed from these equations.

Three indexes of fire occurrence have been used, each indicating different conditions of importance to fire control agencies.

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<sup>1/</sup> Although all days in the April-through-October fire season were used in the calculation of rainless days and number of days since a wetting rain, the burning index rating is based on only the half of the days with highest burning index, according to the Forest Service scale used in the Pacific Northwest Region. Fuel moisture is estimated from records of relative humidity.

<sup>2/</sup> Cramer, Owen P. Relation of number and size of fires to fire-season weather indexes in western Washington and western Oregon. U.S. Forest Serv. Pac. NW. Forest & Range Expt. Sta. Res. Note 175, 11 pp., illus. 1959.

These indexes are (1) the total number of man-caused fires, (2) the percentage of all fires that do not exceed one-fourth acre, and (3) the percentage of all fires that reach 10 acres and larger on State and private lands and 100 acres and larger on National Forests. The first may be useful in evaluating man-caused risk or effectiveness of prevention efforts. Changes in the second index may indicate change in effectiveness of initial attack. Adequacy of followup on larger fires may be reflected in the third index.

### The 1962 Detailed Summary

An informal survey among the users of this analysis indicated that few of the detailed tables were being used. This year, only two tables of season statistics have been included; a summary of season weather indexes for the entire Region (table 1), and the comparison of computed with actual fire occurrence for west-side forest areas (table 2). Conclusions that might have been drawn from the many other tables published in previous years have been included in the discussions for each of the five sections of the Region.

## WESTERN WASHINGTON

### Fire-Season Indexes and Weather

Dominant feature of the fire season was rain. The recurrent spring rains ended June 5. June and July rains were fewer and lighter, but there were several days of wetting rain in early August, another series in mid-September, and the fall rains started September 26. Fair weather the last few days of October led to east winds and trouble with slash fires November 1 and 2. Despite below-normal season indexes for total rainless days and average time since a wetting rain, enough dry weather occurred in short intervals to raise the season burning index to average, though the lowest since 1957. Burning index was not uniform, however, with the lowest of the 19-year record at Boeing Field and the highest since 1951 at Bellingham. Overall severity of the April-October season was slightly below normal (table 1).

Spring. -- Rainfall was above normal in April and May but definitely below normal in June. Temperatures were near normal in April, but May and the first half of June were much colder than normal. The last half of June was much warmer than usual. Spring index numbers showed burning index and spacing of wetting rains slightly below normal, while total rainless days was normal. Humidities below 30 percent were



fewest since 1948, and days with high burning index were fewest since 1957. Average overall severity was slightly below normal and similar to 1961.

Summer. -- July and August were comparatively cool, but the first half of September was about normal. July rainfall was short, but all areas were drenched between August 2 and 20 by at least double the normal monthly rainfall. Other wetting rains occurred September 9-14. Although both burning index and spacing of wetting rains were slightly above normal, total rainless days was below normal. Toledo experienced the fewest rainless days since 1954 and Bellingham the second fewest of the 19-year record. Humidities below 30 percent were fewer than in 1961. Conditions were not uniform, with Bellingham experiencing its second highest season burning index since 1951 and Boeing Field the lowest season burning index since 1955. Summer severity was generally slightly less than ordinary. Lightning storms were of about normal frequency. The Snoqualmie National Forest was hardest hit with 12 lightning storm days, mostly between July 24 and August 6.

Fall. -- This was among the wetter fall periods with general rain September 22 to October 14 and alternating light rain and fair weather into November. Dry, warm weather with east winds in exposed places November 1 and 2 gave a brief return of fire weather before the rains set in again. Though number of rainless days was normal, both burning index and average number of days since wetting rain were below normal. Dry and windy days were more frequent than usual at higher elevations, as indicated by the greatest number of high burning index days since the fall of 1948 at Stampede Pass.

### Fire Occurrence

In terms of total number of man-caused and lightning fires and acreage burned, the 1962 fire season left a better record than its two predecessors. The 24 lightning fires, compared with 282 in 1961, were about equally divided between the National Forests and State and private forest lands. Man-caused fires, 396 in number, were the least reported from State and private lands since the damp fire seasons of 1954 and 1955. This was a tremendous decrease from the 948 man-caused fires of 1961. On National Forests, the 86 man-caused fires, down from an alltime high of 132 in 1961, were the fewest since 1956, a year of similar fire danger. Acreage burned on all ownerships was down to 579 acres compared to 2,775 in 1961 and 2,982 acres in 1960.

## Computed Fire Occurrence

Several comparisons are available with the fire occurrence and fire size that might have been expected in the 1944-56 base period under similar weather indexes. The 602 man-caused fires on State and private forest lands were only 66 percent of the expected number (table 2). In 1961 fire occurrence was 135 percent of the expected number. This is a striking change--the 1961 total was the greatest percentage above the computed fire occurrence in the 19-year period of computed record, and the 1962 figure the third greatest percentage below the computed number. On the same lands, the proportion of all fires remaining a quarter acre and smaller was 76 percent compared with 69 percent expected. The proportion of all fires exceeding 10 acres was 1.7 percent compared with the expected proportion of 2.8 percent. This was the sixth consecutive fire season in which a greater-than-expected proportion of all fires remained small and a less-than-expected proportion became large.

Although the number of man-caused fires on the National Forests was well below the numbers reported the previous 5 years, the 86 fires were 236 percent of the number that would have been expected in a similar season during the 1944-56 base period. This proportion of the expected number has been exceeded by only 1959 and 1960. These figures indicate that the upward trend in number of man-caused fires on these Forests still continues. Difficulty was also experienced in holding fires to a quarter acre and less--where 83 percent of all fires were expected to be within this smallest size class, only 72 percent actually were. Only one fire was expected to exceed 100 acres and one did.

## WESTERN OREGON

### Fire-Season Indexes and Weather

Timely rains dominated the fire season, giving it a damp start, breaking it in early August, lowering September severity, and ending the season with an 8-day deluge in October. This resulted in a below-normal average number of days since a wetting rain despite a greater-than-usual number of rainless days (table 1). However, burning index was slightly greater than normal though the lowest since 1958. All told, the season was about average. Average monthly temperatures were near normal or below. The season was similar to 1961 in spacing of wetting rains, number of days with humidity below 30 percent, and number of high burning index days. Burning index varied: at Eugene

it was the lowest since 1954, while Medford's average was above both 1960 and 1961, and Portland's was well above normal.

Spring. -- Except for a few scattered dry days in April, most of the spring fire weather was in June. Dry weather began on the 4th. Spring burning index was highest since 1955. Despite more than the usual number of rainless days, strategic timing of rains produced shorter-than-usual intervals between wetting rains. Portland had the greatest number of rainless days since the spring of 1952. The overall combination of indexes shows an average spring. Temperatures averaged near normal in April and June, but May was unusually cold with an average temperature 3° to 6° below normal. Rainfall was normal or above in April. It varied from below normal in southwest portions to above normal in the Cascades. June was much drier than normal.

Summer. -- The season's worst fire danger occurred in the last 10 days of July, then general rains August 2 to 8 and cool weather held fire danger low until early in September. The summer burning index averaged slightly above normal though it was the lowest since 1958. Eugene's burning index was the lowest since 1954. Rainfall was negligible except for August 2-8 and September 10 when wetting rains occurred in most portions, producing near-normal figures for number of rainless days and time since wetting rain. Days with relative humidity below 31 percent and days with extreme burning index were similar to the past two summers. Summer fire-weather severity was near normal. Lightning storms were almost a rarity, occurring on an average of only 2.7 days on the National Forests--the lowest number since 1955.

Fall. -- Though there was a near-average number of rainless days and the first 10 and last 20 days of the fall period were rainless, substantial rains in between resulted in the least severe fall fire danger since 1953. East winds November 1 and 2, following a warm period, brought a temporary return of fire weather that resulted in some difficult slash fires. Slash burning ended with rains November 4 and 5. There were other fall periods with similar low indexes in 1940, 1950, and 1953.

### Fire Occurrence

Fire occurrence was lower than in 1960 and 1961. The difference was particularly marked in lightning fires with only 68 this season of which 38 were on the National Forests. In 1961, 652 lightning fires occurred on western Oregon forest lands. Man-caused fires were down only slightly, with 177 occurring on National Forests, the same as in

1961, and 492 on State lands--down slightly from 532 in 1961. The 5,704 acres burned was well below the 13,063 acres burned in 1961 and the 9,666 acres in 1960. Number of fires from all causes, 522 on State and private lands and 215 on National Forests, was the lowest since 1957 on both ownerships.

### Computed Fire Occurrence

In comparison with a season of similar weather in the 1940-56 base period, the 1962 fire-occurrence pattern on State and private lands was almost exactly as expected (table 2). Number of man-caused fires was only 9 short of the 501 expected; 57.5 percent of all fires remained within a quarter acre compared to an expected 58.0 percent; and while 10.4 percent of all fires were expected to reach 10 acres and greater in size, 10.5 percent did reach this size.

Western Oregon National Forests appear to be having increasing difficulty from man-caused fires. The 177 fires that occurred were 168 percent of the expected number. This was the highest percent of expected ever computed for this area; it compares with 152 percent of expected last year and 123 percent in 1960. This was the fourth successive season of increase in this factor. On the favorable side, the percentage of fires held to a quarter acre or less was greater than expected for the sixth consecutive year, and the one fire exceeding 100 acres was only half the number expected.

## EAST-CENTRAL WASHINGTON

### Fire-Season Indexes and Weather

Strategically timed wetting rains, particularly in the northern portion, plus only short periods of hot, dry, and windy weather, combined to make a fire season of less than the usual severity. All three indexes were below normal (table 1). Outstanding was the average number of days since a wetting rain, some 9 days less than the 10-year normal. April was the only month with above-normal temperature, while rainfall was well above normal in May, August, and October.

Spring. --All three indexes were low with total rainless days the lowest since 1953. Both rain indexes were similar to those of 1961, but burning index was considerably lower. Though April temperatures were well above normal, May was the coldest and wettest of record at many stations, and June didn't warm up to normal until the last 2 weeks.



June rainfall was well below normal.

Summer. -- Wetting rains at Omak on July 5 and August 3 brought the average number of days since a wetting rain well below the summer normal, though total rainless days was normal. Burning index also was relatively lower than recent years at Omak. General severity was less than normal. Lightning storms were more frequent than usual with almost daily storms, somewhere over the forests, between July 24 and August 6.

Fall. -- Fall weather also averaged below normal severity. Burning index and spacing of wetting rains were both less than normal, while total number of rainless days was normal. The second half of September was warm, and the Okanogan National Forest reported 3 days with lightning storms. A wetting rain occurred on the 28th followed by light rains and another wetting rain October 11-12.

### Fire Occurrence

With weather indexes showing season severity well below that of the previous 2 years, fire occurrence figures followed a similar pattern. Total number of man-caused fires on all ownerships was 185 compared with 307 in 1961 and 394 in 1960. Total area burned was 2,438 acres about equally divided between the National Forests and State and private lands. This compares with 14,008 acres in 1961 and 11,312 in 1960. The greater-than-usual number of days with lightning storms produced 368 lightning fires compared with 638 in 1961 from a similar number of storm days. This compares with only 70 lightning fires from about half the number of storm days in 1960.

## NORTHEAST OREGON

### Fire-Season Indexes and Weather

A record-setting wet and cold May, cool temperatures in July and August, and an 8-day rainy period in early October fairly well dominated the season. Season burning index was slightly lower than the previous 2 years, the intervals between wetting rains were slightly shorter than normal, while the number of rainless days was slightly more than usual (table 1). Though June-through-September rainfall was the least of record over much of the area, absence of prolonged hot weather helped keep the season's average fire danger slightly below normal.

Spring. -- Average number of days since a wetting rain was lowest since 1958 as a result of sporadic rains in April and off-an-on rainy weather from April 27 to May 25. June was practically rainless, and the total number of rainless days was slightly above the spring average. A warm April and a dry June offset the effects of one of the coldest and wettest Mays of record in the north portion, resulting in a spring burning index similar to 1961. However, the spring burning index was lower than normal at Pendleton and Meacham but the highest of record at Burns. The worst fire weather of the season was in the last half of June when high burning index days were most frequent.

Summer. -- Though temperature averaged below normal in July and August, July was rainless, and in August there were spotty, mostly light rains early in the month. Average burning index was below that of 1961, but based on the few years of record, individual station averages were comparatively high at Redmond and Pendleton and low at Meacham. Average number of days since wetting rain was fourth highest in 24 years of record. Total rainless days was slightly greater than ordinary with only 4 days with rain at both Burns and Redmond. Overall summer severity was near normal. There were more lightning storms than usual but fewer than in either 1960 or 1961. Most storms occurred between July 21 and August 11. The Wallowa-Whitman and Umatilla Forests reported 25 and 24 days with lightning.

Fall. -- Spotty rains in late September, accompanied by lightning on 5 days, and general wetting rains October 7-14 were factors of fall fire weather. Average burning index was quite low, average number of days since a wetting rain was only half normal and the lowest since 1940, and total rainless days was below normal. Fall was not a problem though no rain occurred the last half of October.

### Fire Occurrence

Under the influence of slightly lower fire danger than the two preceding fire seasons, with one exception fire occurrence figures were below those of both 1960 and 1961 on all ownerships. The 102 man-caused fires on State and private lands exceeded the 77 man-caused fires reported on those lands in 1960. The 205 man-caused fires on all ownerships compares with 277 in 1961 and 254 in 1960. With fewer lightning storms, the 368 lightning fires were far fewer than the 1,051 of 1961. Total area burned was 3,422 acres, down from 68,644 acres in 1961 and 88,168 acres in 1960. Though State and private lands had 159 fires compared with 414 fires on National Forest lands, their acreage burned was 2,853 compared with 569 acres on the higher elevation National Forests.

## SOUTH-CENTRAL OREGON

### Fire-Season Indexes and Weather

A very cold and wet May, a cool summer with a little rain in August, and an unusually wet October kept the fire season to near-normal severity in comparison with past years. Burning index was lower than in the preceding two seasons, while average number of days since wetting rain was slightly above normal, and total rainless days was ordinary (table 1).

Spring. -- Normal spring fire danger resulted from normal spacing of wetting rains, burning index below that of the previous two springs, and slightly more than the normal number of rainless days. April was warm and dry, but was counteracted by an extremely cold and wet May. June rain was negligible and temperature was normal.

Summer. -- Though temperatures were below normal in July and August, summer burning index was normal. Early August rains, mostly in the northern portion, brought about twice the normal monthly rainfall; however, average time since a wetting rain was well above normal, and total rainless days slightly higher than normal. General severity was normal. Lightning storm occurrence was normal. The Fremont, with 15, had the most lightning storm days.

Fall. -- Following sporadic light rains in late September, unusual, almost daily wetting rains October 7 through 14 brought the fire season to an abrupt close. October rainfall was more than twice normal over most of the area. All three indexes were below average severity despite a return to dry weather the last 2 weeks of October. This fall was among those with the lowest fire danger in south-central Oregon forests.

### Fire Occurrence

With fire-season weather indexes near normal, total fire occurrence figures for all ownerships were lower than in the previous two seasons, though on State and private lands there were a few more fires, both lightning and man-caused, than in 1960. The 174 man-caused fires (121 on National Forests and 53 on State and private lands) compares with 224 in 1961. Lightning produced 155 fires compared with 440 in 1961. Acreage burned on both ownerships was below that of the preceding 2 years; the 1,385 burned acres compares with 2,967 acres burned in 1961.

## COLUMBUS DAY STORM

Although it was accompanied by very low burning index in most areas, the Columbus Day storm was the 1962 weather event with the greatest impact on fire control agencies. This storm was the most severe, in terms of widespread damage, to hit the Region in historical times, and few, if any, storms have exceeded its fury even in smaller areas. Forest fuel types over much of the Douglas-fir region in Oregon and Washington were converted in a few hours from low to moderately hazardous second-growth and old-growth stands to jumbled masses of smashed trunks and tops that, with the 1963 dry season, will become a mammoth collection of red Douglas-fir slash. This was the result of an unusually intense extra-tropical cyclone (the usual Temperate Zone storm) which moved north along the coast bringing hurricane-force winds (75 m. p.h. ) to most of the Douglas-fir region. Winds exceeding 100 miles per hour, at least in gusts, were undoubtedly experienced in most exposed portions of western Oregon and western Washington. The Coast Ranges received the brunt of the storm, though there was severe damage in the Willamette Valley and north into the Puget Sound area. The Cascade foothills sustained extensive blowdown, but the winds eased off before reaching the Cascade Crest. Scattered blowdown also occurred over an extensive area east of the Cascades.

Although peak gusts probably were not observed at most reporting stations due to power outages or absence of wind-recording instruments, the following reported maxima are generally indicative: Mount Hebo (USAF), 170 m. p.h. (estimated); Morrison Bridge (Portland), 116 m. p.h. ; Troutdale (FAA), 106 m. p.h. ; Naselle, Wash. (USAF), 160 m. p.h. ; Renton (FAA), 100 m. p.h.



Table 1.--1962 fire-season<sup>1/</sup> weather indexes and comparative  
data for Oregon and Washington<sup>2/</sup>

Section and index	Cur- rent year (1962)	Pre- vious year (1961)	10-year average (1952-61)	Record <sup>3/</sup>		
				Low	High	
Western Washington:						
Burning index	14.6	15.1	15.0	11.8 (1955)	21.4 (1951)	
Average days since wetting rain	10.9	12.6	11.8	7.0 (1948)	28.9 (1951)	
Total rainless days	128.2	146.6	137.2	122.7 (1941)	162.3 (1938)	
Western Oregon:						
Burning index	27.2	29.2	26.4	18.5 (1953)	31.3 (1951)	
Average days since wetting rain	19.3	19.8	23.5	13.5 (1941)	48.8 (1932)	
Total rainless days	163.5	155.2	157.3	139.5 (1948)	176.0 (1952)	
East-central Washington:						
Burning index	25.4	34.8	--	--	38.8 (1950)	
Average days since wetting rain	37.6	50.2	46.9	14.7 (1948)	88.5 (1939)	
Total rainless days	179.5	182.5	182.6	164.5 (1948)	197.0 (1949)	
Northeastern Oregon:						
Burning index	32.8	35.6	--	--	35.8 (1949)	
Average days since wetting rain	33.7	43.9	35.4	18.1 (1948)	53.6 (1949)	
Total rainless days	179.0	176.7	176.4	153.6 (1948)	190.0 (1949)	
South-central Oregon:						
Burning index	30.4	33.6	--	--	37.2 (1949)	
Average days since wetting rain	38.8	26.4	35.2	24.2 (1952)	61.3 (1960)	
Total rainless days	180.3	180.3	180.5	174.0 (1956)	190.7 (1949)	

<sup>1/</sup> April 1 through October 31.

<sup>2/</sup> Indexes based on observations at certain Weather Bureau and FAA stations (see table 2).

<sup>3/</sup> See table 3 for exact periods of record.

Table 2.--Computed and actual fire occurrence in 1962:  
western Oregon and western Washington<sup>1/</sup>

Measure of occurrence and area	1962 occurrence		Actual occurrence as percentage of computed		
	Com- puted	Actual to 10/31	1962	1961	10-year average (1952-61)
			-----Percent-----		
Man-caused fires (number):					
State and private:					
Western Oregon	501	492	98.2	131.6	95.1
Western Washington	602	396	65.8	135.4	103.9
National Forest:					
Western Oregon	106	177	<sup>2/</sup> 168.0	151.8	113.1
Western Washington	36	86	236.9	212.9	191.0
Fires 1/4 acre and less (percentage of all fires):					
State and private:					
Western Oregon	58.0	57.5	99.2	116.0	107.3
Western Washington	69.3	76.0	110.0	126.3	112.2
National Forest:					
Western Oregon	74.4	82.7	111.0	115.7	106.2
Western Washington	82.8	72.0	87.0	98.5	100.8
Fires 10 acres and larger (percentage of all fires):					
State and private:					
Western Oregon	10.4	10.5	101.4	67.7	84.9
Western Washington	2.8	1.7	61.5	37.4	67.6
Fires 100 acres and larger (percentage of all fires):					
National Forest:					
Western Oregon	1.6	0.5	28.2	16.3	<sup>3/</sup> 45.4
Western Washington	1.0	1.0	104.2	50.4	<sup>4/</sup> 54.3

<sup>1/</sup> Computed fire occurrence is derived from equations expressing the relation between season fire-weather indexes and occurrence, 1940-56 in western Oregon and 1944-56 in western Washington.

<sup>2/</sup> Highest of record.

<sup>3/</sup> Average for 8 years. Computed occurrence was zero in 1953, and actual occurrence was zero in 1954.

<sup>4/</sup> For only the 5 years in which fires 100 acres and larger occurred. None occurred 1953-57.

Table 3.--Sources of data

Section and station	Elevation (feet)	Agency	Data used for		Period of computed record
			BI	Rainfall indexes	
Western Washington:					
Bellingham	150	FAA	yes	yes	Burning index
Seattle (Boeing)	32	Wea. Bur.	yes	no	1944-62. Rain-
Toledo	351	FAA	yes	yes	fall indexes
Stampede Pass	3,958	Wea. Bur.	yes	no	1936-62.
Hoquiam	14	FAA	no	yes	
Western Oregon:					
Portland	21	Wea. Bur.	yes	yes	Burning index
Eugene	361	Wea. Bur.	yes	yes	1932-62 except
Sexton Summit	3,836	Wea. Bur.	yes	no	for 1933, 1934,
Medford	1,312	Wea. Bur.	yes	yes	1937, and 1939.
North Bend	11	FAA	no	yes	Rain indexes
					1922-62 except
					1923 and 1927.
East-central Washington:					
Yakima	1,061	Wea. Bur.	yes	yes	Burning index
Omak	1,228	Wea. Bur.	yes	yes	computed for
					known bad years:
					1945, 1949, 1958-
					61. Rain indexes
					1939-62.
Northeastern Oregon:					
Pendleton	1,492	Wea. Bur.	yes	yes	Burning index
Meacham	4,050	Wea. Bur.	yes	no	computed for
Redmond	3,075	FAA	yes	yes	known bad years:
Burns	4,140	Wea. Bur.	yes	yes	1949, 1951, 1960-
					61. Rain indexes
					1939-62.
South-central Oregon:					
Redmond	3,075	FAA	yes	yes	Burning index
Klamath Falls	4,098	Air Force	yes	yes	computed for
Lakeview	4,774	Wea. Bur.	yes	yes	known bad years:
					1949, 1951, 1960,
					1961. Rain in-
					dexes 1949-62.







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